

I CLAIM:

1 1. A sprinkler circuit comprising:
2 a control circuit electrically connectable in series to a sprinkler cable
3 running between a sprinkler controller and a sprinkler valve; and
4 a moisture responsive circuit electrically connected to the control circuit,
5 wherein the control circuit is powerable by a valve signal sent from the
6 sprinkler controller to the sprinkler valve, and wherein the control circuit is
7 adapted to interrupt the valve signal to the sprinkler valve when the moisture
8 responsive circuit experiences water.

2. The sprinkler circuit of Claim 1, wherein the control circuit includes a
rectifier for rectifying the valve signal to generate a rectified signal.

3. The sprinkler circuit of Claim 2, wherein the control circuit further includes
a low pass filter to filter the rectified signal to generate a filtered signal with
reduced high frequency components.

4. The sprinkler circuit of Claim 3, wherein the control circuit provides the
filtered signal to the moisture responsive circuit through a first port.

1 5. The sprinkler circuit of Claim 4, wherein:
2 the moisture responsive circuit generates an attenuated signal by
3 attenuating the filtered signal, wherein the attenuation is small when the
4 moisture responsive circuit experiences water;
5 the attenuated signal is provided to a second port on the control circuit;
6 and
7 the valve signal to the sprinkler valve is interrupted when the attenuated
8 signal exceeds a threshold.

6. The sprinkler circuit of Claim 5, wherein the second port is attached to a
relay, and wherein the relay interrupts the valve signal to the sprinkler valve
when the attenuated signal is sufficient to energize the relay.

7. The sprinkler circuit of Claim 6, wherein the control circuit includes a
manual switch (M) electrically connected between the second port and the relay,
wherein opening the manual switch over rides the moisture responsive circuit.

1 8. The sprinkler circuit of Claim 5, wherein the moisture responsive circuit
2 includes a first pair of electrodes, wherein the first pair of electrodes is
3 electrically connected between the first port and the second port, and wherein a

4 first resistance across the first pair of electrodes is reduced when the first pair of
5 electrodes experiences water.

1 9. The sprinkler circuit of Claim 8, wherein the moisture responsive circuit
2 further includes a second pair of electrodes, wherein a second resistance across
3 the second pair of electrodes is reduced when the second pair of electrodes
4 experiences water, and wherein the first pair of electrodes and the second pair
5 of electrodes are serially electrically connected between the first port and the
6 second port.

10. The sprinkler circuit of Claim 9, wherein the first pair of electrodes are
separated by between 1/16 inches and 1/8 inches, and wherein the second pair
of electrodes are separated by between 1/16 inches and 1/8 inches.

11. The sprinkler circuit of Claim 9, wherein the first pair of electrodes are
separated by approximately 3/32 inches, and wherein the second pair of
electrodes are separated by approximately 3/32 inches.

12. The sprinkler circuit of Claim 9, wherein the first pair of electrodes and the
second pair of electrodes are made from one of a group consisting of copper
alloy, aluminum alloy, and stainless steel.

13. The sprinkler circuit of Claim 12, wherein the first pair of electrodes and the second pair of electrodes are made from stainless steel.

14. The sprinkler circuit of Claim 4, wherein control circuit includes a Potentiometer (P) between the filter and the first port for adjusting the control circuit for various soil types and plant types.

15. The sprinkler circuit of Claim 1, wherein the control circuit includes an AC relay for controlling the transmission of the valve signal to the sprinkler valve, and wherein the valve signal is attenuated by a potentiometer and provided from the potentiometer to the moisture responsive circuit and from the moisture responsive circuit to the AC relay.

16. The sprinkler circuit of Claim 1, wherein the valve signal is a DC signal and wherein the control circuit includes a relay for controlling the transmission of the valve signal to the sprinkler valve, and wherein the valve signal is attenuated by a potentiometer and provided from the potentiometer to the moisture responsive circuit and from the moisture responsive circuit to the relay.

17. An irrigation system comprising:

at least one sprinkler valve;

3 a control circuit providing a valve signal to the sprinkler valve; and
4 a moisture responsive circuit electrically connected between a first port
5 and a second port of the control circuit, the moisture responsive circuit including
6 a first pair of electrodes and a second pair of electrodes serially connected
7 between the first port and the second port, wherein a first resistance across the
8 first pair of electrodes is reduced when the first pair of electrodes experiences
9 water and a second resistance across the second pair of electrodes is reduced
10 when the second pair of electrodes experiences water,
11 wherein the control circuit interrupts the valve signal to the sprinkler valve
12 when the sum of the first resistance and the second resistance is below a
13 resistance threshold.

1 18. The sprinkler circuit of Claim 17 wherein:
2 the control circuit is electrically connected in series to a sprinkler cable
3 running between a sprinkler controller and the sprinkler valve;
4 the valve signal is generated by the sprinkler controller; and
5 the control circuit is powered by the valve signal.

19. The sprinkler circuit of Claim 17 wherein the first pair of electrodes and
the second pair of electrodes are separated horizontally by between one inch
and five inches.

20. The sprinkler circuit of Claim 19 wherein the first pair of electrodes and the second pair of electrodes are separated horizontally by approximately three inches.

21. The sprinkler circuit of Claim 17 wherein the first pair of electrodes and the second pair of electrodes are vertically separated by between two inches and twelve inches.

22. The sprinkler circuit of Claim 21 wherein the first pair of electrodes and the second pair of electrodes are vertically separated by approximately four inches.

1 23. A method for controlling an irrigation system, the method comprising:
2 serially connecting a control circuit to a sprinkler cable carrying a valve
3 signal to a sprinkler valve;
4 providing the valve signal to a rectifier and to a relay;
5 rectifying the valve signal in the control circuit to generate a rectified
6 signal;
7 providing the rectified signal from the control circuit to a moisture
8 responsive circuit;

9 variably attenuating the rectified signal in the moisture responsive circuit
10 to obtain an attenuated signal, wherein the amount of attenuation depends on
11 the amount of water experienced by the moisture responsive circuit;
12 providing the attenuated signal from the moisture responsive circuit to the
13 relay in the control circuit, wherein the level of the attenuated signal determines
14 if the relay is energized;
15 zeroing the valve signal to the sprinkler valve if the relay is energized;
16 and
17 providing the valve signal to the sprinkler valve through the relay if the
18 relay is un-energized.